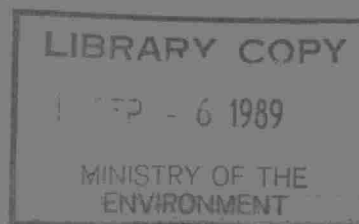


PHYTOTOXICOLOGY INVESTIGATION
IN THE VICINITY OF
ELMIRA REFINERS, PARIS, ONTARIO
OCTOBER 1987

JUNE 1989



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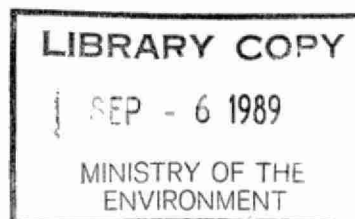
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PHYTOTOXICOLOGY INVESTIGATION
IN THE VICINITY OF
ELMIRA REFINERS, PARIS, ONTARIO
OCTOBER 1987

Report prepared by:

Dr. W. D. McIlveen

PHYTOTOXICOLOGY SECTION
AIR RESOURCES BRANCH



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**Phytotoxicology Investigation in the Vicinity of
Elmira Refiners, Paris, Ontario
October 1987**

Introduction

On September 28, 1987, a request was made by the Hamilton District office of the Ontario Ministry of the Environment to the Phytotoxicology Section, Air Resources Branch, Ministry of the Environment for a survey of condition of vegetation in the vicinity of Elmira Refiners Ltd. located in Paris, Ontario. The survey was conducted on October 4, 1987 by W. D. McIlveen, Phytotoxicology Section. This report includes the results of that survey.

Field Investigation

The Elmira Refiners Ltd. operation is located on the northern edge of a small industrial park situated on the northern edge of the Town of Paris. The property immediately west of Elmira Refiners was planted to corn at the time of the investigation. It was not possible at the date of the visit to observe any acute toxicity symptoms to the foliage since the plants in the entire area had turned brown and were necrotic. This condition was attributed to the lateness of the season and the periods of frost which had been experienced. However, the corn plants appeared to be of normal size and to have a normal filling of kernels in the ears which were examined.

A large maple tree growing along the fence line had lost all of its foliage due to normal autumn leaf fall. The few weeds seen in the field were healthy but their low numbers probably reflect the use of herbicides on the crop. Light to moderate marginal necrosis on the foliage of a wild raspberry plant may have been associated with normal senescence. A wild apple tree was heavily infested with leaf mining insect.

Samples of corn foliage were collected at the fence line (Site 1), at about 250 meters west of Elmira Refiners (Site 2) and at a control location about 2 km north.

Laboratory Analysis

The samples of foliage were returned to the Phytotoxicology Laboratory for processing prior to chemical analysis. The samples were dried in an oven, ground in a Wiley mill and stored in glass bottles. They were forwarded to the M.O.E. Laboratory at Resources Road for chemical analysis to determine their content of nitrogen, phosphorus, potassium, sulphur, chloride, sodium, calcium, magnesium, and fluoride. These elements include the inorganic elements indicated as possible emissions from the plant.

The analytical results are presented in the attached table. For the most part, the chemical composition of all samples was considered normal. The only deviation from normal was a gradient of sodium and chloride with distance of the sampling sites from the Elmira Refiners operations. This gradient would be consistent with the possible emissions of sodium hypochlorite from the plant. Although there is an elevation in concentration of these elements, they are still below the concentrations considered to be toxic to corn.

Summary

A survey of the conditions of vegetation in the vicinity of Elmira Refiners Ltd. in Paris, Ontario was carried out by the Phytotoxicology Section, Air Resources Branch on October 4, 1987. Owing to the lateness of the season which was accompanied by frost injury to the foliage, an accurate assessment of acute injury to vegetation could not be made. Samples of corn foliage were collected for chemical analysis. The results of this analysis indicated that elevated concentrations of sodium and chloride were present in a gradient away from the operation but these were not considered to be in the toxic range. If additional assessments are requested in future years, the field inspection should be carried out prior to the onset of frost and natural senescence in the fall.

Table 1: Concentrations* of chemical elements in corn foliage samples collected in the vicinity of Elmira Refiners, Paris, Ontario October 1987

Element	Location		
	Site 1	Site 2	Control
Nitrogen (%)	0.75	1.06	0.82
Phosphorus (%)	0.14	0.14	0.30
Potassium (%)	0.23	0.53	0.54
Sulphur (%)	0.11	0.15	0.12
Chloride (%)	0.05	0.02	0.03
Sodium (µg/g)	650	100	44
Calcium (µg/g)	5700	9200	8700
Magnesium (µg/g)	3400	2900	2800
Fluoride (µg/g)	2	3	1

* Concentrations are reported as % or µg/g (PPM) on an oven dry basis

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